been controlled by atrial overdrive pacing and mitral valve replacement.

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Treatment of Myxedema and Myxedema Coma

EXCEPT FOR myxedema coma, there are few situations in which hypothyroidism requires rapid restoration of the eumetabolic state. Hypothyroid patients are sensitive to thyroid hormone replacement, even at low doses and, therefore, therapy should be initiated at a dosage of no more than 50 μg of levothyroxine per day. In patients with underlying heart disease or severe hypothyroidism the initial daily dose should be even lower. The dose should then be increased by 25 to 50 μg at two- to four-week intervals until a normal metabolic state is reached. The final maintenance dose should be approximately 200 μg per day.

Occasionally, cardiovascular or psychiatric complications limit the use of the full therapeutic dose and replacement therapy must be modified to attain the maximal metabolic state without adverse effects.

The clinical state of the patient is generally the best determinant of adequate thyroid hormone replacement. The wide range of normal for thyroxine (T_4) concentration makes the T_4 determination useful only as a confirmation of a patient's metabolic state. In a patient with thyroprival hypothyroidism, thyroid-stimulating hormone (TSH) determinations can be used to assess the patient's response to thyroid hormone replacement.

Although levothyroxine appears to be the agent of choice in replacement therapy of hypothyroidism, for those who prefer other agents the equivalent doses are levothyroxine, 100 μg; liothyronine, 25 μg, and thyroid extract, 60 mg.

The severity of myxedema coma requires that the diagnosis be made clinically and therapy begun immediately. Therapy should be initiated with 400 to 500 μg of levothyroxine given intravenously. Respiratory care is critical and hypoventilation should be treated by assisted ventilation and controlled oxygen administration. The occasional associated hypoglycemia should be treated with concentrated glucose solutions to avoid water intoxication. Dilutional hyponatremia should be treated by water restriction but may occasionally require hypertonic saline infusion. Hydrocortisone, 100 to 200 mg per day, should be administered intravenously. The patient should not be actively warmed. Precipitating factors such as infection should be sought and treated.

Although myxedema coma generally has a poor prognosis, a regimen such as the above, especially with critical attention to respiratory care and ideally in the setting of an intensive care unit, should increase survivals.

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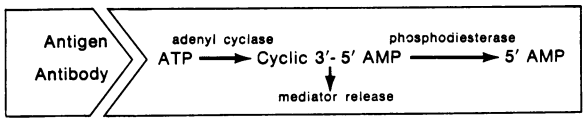
Bronchodilator Pharmacology

ALTHOUGH A VARIETY of catecholamine and xanthine preparations have been used for the treatment of asthma and other types of airway obstruction for many years, only recently has the mechanism of action of these agents become appreciated. An understanding of bronchodilator pharmacology has led to the rational use of these agents and has given impetus to the search for additional agents with greater specificity of action.

The airway obstruction of acute bronchial asthma is due, at least in part, to the release of several biologically active substances, as shown in a simplified diagram in Figure 1.



AMP = adenosine monophosphate
ATP = adenosine triphosphate

Figure 1.—Diagram showing release of biologically active substances.